Film and TV

TV / Science TV series

Teacher's notes

Age: Young learners (10–12)

Level: Pre-intermediate (A2)

Time: 75 minutes (plus an optional 15–30 minutes if you choose to do the final project)

Activity: In this lesson, students will:

1. focus on vocabulary and speaking related to science and measurement;
2. improve listening comprehension of real-life English in two online videos;
3. study and utilise language for describing 'real versus fake';
4. consolidate new language from this lesson by carrying out two simple science experiments.

Language focus: speaking, listening, vocabulary, reading

Materials: one copy of the *Secret words* worksheet, cut up; one copy of the worksheet per student; a PC or projector, an internet connection in the classroom; for the final project, you will need the following materials (depending on whether you want to do one or both experiments):

- Experiment 1: plastic glasses; a couple of boxes of paper clips per group; enough water to fill the plastic glasses.
- Experiment 2: one copy of the *Sink or float* worksheet per group; a large container filled with water (perhaps a plastic bin or even a classroom sink); eight common items, some which will float and others which will sink (e.g. a boardpen, a piece of chalk, a partially-filled lunchbox, an empty wallet, an ID card, a sock, a sharpener, an eraser, a paper clip, a full bottle of fizzy drink, etc).

Notes:

1. This lesson is aimed at lower-level learners (approximately A2). However, certain vocabulary from this lesson would typically belong at higher levels. This is because the videos referred to are authentic and therefore not graded for language learners. You may wish to let students know that a small number of words from the lesson (e.g. 'astonishing', 'a hoax') are from a higher level. Let students know that they shouldn't worry if they find the lesson challenging or if they hear certain words that they don't understand.
2. This lesson contains exercises that focus on listening, speaking, vocabulary and reading. If you wish to maximise class time for listening and speaking, you could ask students to complete the vocabulary and reading exercises as preparatory homework before the lesson. It would then only be necessary to quickly correct these parts in class. The exercises which could be done as preparatory homework are marked with a symbol.

1. Warmer (5 minutes)

Aims: to create interest in the topic of the lesson (science and the natural world), to identify language that students already know related to this topic

Procedure: Chop up the cards from the *Secret words* worksheet if you haven't already. Take the card with the word 'water'. Allow students to see that you are holding a card but don't let them see the word on it. Tell students that you are going to describe the word that is written on the card. They need to listen carefully and guess the word. If students think they know the word, they must put up their hand to suggest it. Begin your description, making each clue easier than the last. For example:

- *When it gets to 100 degrees Celsius, it boils.*
- *When the temperature is very cold, it freezes and it becomes ice.*
- *People use it for cooking food and it's also very important for washing.*
- *Both a river and the sea contain a lot of it!*
- *If you're thirsty, you need to drink it.*

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Continue giving clues until at least one student calls out the correct answer. Then divide the class into two groups and read aloud the instructions from the second point on the worksheet. As each speaker comes to the front of the class, hand them one of the cards with a secret word. (There are nine words to choose from, so you can either give the cards out randomly or choose in advance which six to hand out.) Allow each selected speaker to describe their word to their group. If the group correctly guesses within 30 seconds, they get a point. Finally, decide the winning group.

2. Vocabulary and speak (15 minutes)

Aims: to introduce vocabulary related to common types of scientific measurements, to provide spoken practice of this vocabulary, to develop interest in the topic of the lesson (science and the natural world)

Procedure: On the board, write the word 'measure'. To elicit the meaning, perhaps draw pictures or show photos of a thermometer, a ruler, weighing scales, etc. Tell students that the idea of measuring is very important in science, so they are going to look at some vocabulary for this.

Ask students to complete Task 2a in pairs. Tell them that the information in the table may seem quite technical to them. Rather than seeing the language in the box as something to memorise, students should see it as a reference that will help them to understand later tasks in this lesson. Monitor as they do the task, helping weaker students. Finally, elicit the correct answers.

Key:

Question	***We need to measure …***	***Units common in Europe***
is it long or ***short****?*	*distance*	***metres*** */ kilometres*
is it hot or cold?	***temperature***	*degrees Celsius*
is it big or ***small****?*	*area*	*square metres (or metres squared)*
is it fast or slow?	***speed***	*metres per second / kilometres per hour*
is it heavy or light?	***weight***	***grams*** */ kilograms*

In the same pairs, ask students to look at Task 2b. For this task, encourage students to speak to their partners as much as possible, explaining the reasons why they think a certain statement is true or false. Remind them that they may well have studied many of these items in their science class. Set a time limit of around six or seven minutes. Monitor the students as they do this, making sure that they are speaking in English to justify their answers. Finally, elicit the correct answers. For the more difficult statements, ask students who guessed correctly to explain what their reasoning was.

Key:

a. False – NY to London is 5,585 kilometres.
b. True
c. False – water is a combination of hydrogen and oxygen (H_2O)
d. False – the gravity on the moon is only a sixth of the force on Earth (so this person would only weigh 7 kilos on the moon)
e. False – a hare can run up to 80 km/hour but not 120 km/hour.
f. True
g. False – Russia is the biggest country (17.1 million square kilometres). Canada is second biggest.
h. True – water expands when it is heated. However, there is an exception to this between 0–4 degrees.
i. True
j. False – it takes 8 minutes.

3. Vocabulary, listen and speaking (25 minutes)

Aims: to study science-related vocabulary that will help students to understand a short video, to practise listening to and understanding a TV clip, to practise speaking about topics related to science

Procedure: Ask students to work in pairs. Give them a few minutes to complete the vocabulary task, 3a. Monitor as they do this, and help weaker students. Finally, elicit the correct answers and focus on pronunciation of new words.

Key:

Vocabulary	**Definition**
1. to spray	**(6)** to change from a solid to a liquid (e.g. ice changes to water)
2. a mirror	**(4)** the material from a tree
3. astonishing/ amazing	**(7)** a type of metal which is very strong
4. wood	**(1)** to push liquid from a container into the air (common for perfumes)
5. sunshine	**(3)** very surprising
6. to melt	**(2)** a special piece of glass that reflects – you probably have this in your bathroom
7. steel	**(5)** the light from the sun

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Read aloud the initial worksheet instructions for Task 3b, including the question 'What three items do they put under the mirror?'. Play the video ('Jem Melts Rock Using Sunshine – Bang Goes The Theory – Series 3, Episode 5 Preview – BBC One' www.youtube.com/watch?v=z0_nuvPKIi8) and then elicit the answer.

Key:

The items are wood, steel and a rock – they also spray some water under the mirror so this answer is also acceptable.

Before playing the video for a second time, ask students to work in pairs and to read sentences a–f, which they will need to complete. They might be able to remember some of the answers at this stage. Play the video, then allow the pairs to discuss their answers. Finally, elicit the correct answers.

Key:

a. water, b. surprised, c. 3,500 degrees, d. 2 square metres, e. 93 million miles, f. rock

4. Ask students to discuss the questions in Task 3C in pairs. Give feedback. Focus on good 'science' language that students have used.

4. Reading, vocabulary, listen and speak (30 minutes)

Aims: to practice reading short opinions related to science, to study vocabulary related to science and 'real versus fake', to practise listening to and understanding a TV clip, to practise speaking about whether certain ideas are scientifically possible

Procedure: Before beginning this task, open the video on YouTube (don't allow students to see) and pause it at around 0.24 ('Running on Water – Outrageous Acts of Science' www.youtube.com/watch?v=WYRNBZOKp_M). At this point, we can see the man running across the lake. While paused, put the video in 'full screen' mode so that the screen doesn't show any of the YouTube written descriptions.

Show the paused YouTube screen to the students and tell them that they are going to watch this video in a moment. Read aloud the instructions for Task 4a and then give students a moment to read the opinions in the speech bubbles. Elicit the answers about whether each person thinks the video is real or false.

Key:

Opinion A = real , Opinion B = false, Opinion C = real, Opinion D = false

Ask students to complete Task 4b in pairs. Monitor as they do so. Finally elicit the answers and focus on correct pronunciation.

Key:

a. a hoax, b. a stone, c. the surface, d. fake, e. sink, f. float

Read aloud the initial worksheet instructions for Task 4c, including the question: 'Is the video real or fake?' Play the video and then elicit the answer.

Key:

The video of the man running on the lake is fake.

Before playing the video for a second time, ask students to work in pairs and to read sentences a–e, which they will need to complete. Play the video, then allow students to discuss their answers in pairs. Finally, elicit the correct answers.

Key:

a. 13.5 million, b. fast, c. big, d. 10.4, e. secret platform

Ask students to discuss the questions in Task 4d in pairs. Give feedback. Focus on good 'real versus fake' language that students have used.

5. Optional project: Science experiments (15 minutes per experiment)

Aims: to consolidate new language from the lesson, to practise speaking using language related to science, to aid long-term recall of language from the lesson by allowing students to participate in experiments

Procedure:

Experiment 1

Ask students to work in groups. Give each group an empty plastic glass and plenty of paper clips. (You could try out the experiment before the class to see how many paper clips you will need. For a regular-sized glass, you could need about 200 paper clips. This is about two small boxes of clips.) This experiment involves water so make sure the students are sitting in a place where they can make small spillages.

Tell students that in a moment, they are going to completely fill the glass with water. Then they will add in as many

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paper clips as possible without spilling the water. Before doing this, they must imagine how far up the glass the paper clips will reach. They should discuss this and then draw a line on the glass to show their prediction.

Ask each group to completely fill their glass with water. They could use a bottle of water or a tap. However, it's probably best to use a bottle to add the final few drops, making sure that the glass is full to the very brim.

Follow steps 3 and 4, as per the worksheet. What generally happens with this experiment is that the glass is able to hold a surprising amount of paper clips. The clips often fill 50–70% of the glass before any water starts to leak out. Due to the surface tension of the water, it often forms a bulge over the top of the glass but doesn't spill until after many paper clips have been added.

Once all the groups have completed the experiment, decide which had the most accurate prediction. Then decide which group has added the most paper clips.

Try to elicit an explanation for the experiment. Perhaps a student will be able to explain the idea of surface tension – the elastic tendency of the surface of liquids. Students may also mention that the actual surface area of a paper clip is much smaller than it appears.

Experiment 2

Fill a large container with water. This could be a large plastic box, a classroom bin, or a classroom sink. Ideally, it will be possible for all students to see items being put into the water.

Show students the items which you are going to put into the water. These items should be chosen so that some of them will float and some will sink. See the 'Materials' section at the start of this worksheet for some suggested items.

Ask students to work in groups. Refer them to the **Sink or float?** page at the end of their worksheets. Tell them that they have a few minutes to predict whether each item will sink or float. To help them, write the name of each item on the board so that they can copy it into the worksheet (e.g. 'boardpen'). Then allow them to make their predictions. Monitor as they do this, encouraging them to speak English and asking questions about their predictions. They should all write down the group's predictions so they have a copy.

Once the predictions have been completed, each group must pass one copy of the **Sink or float?** sheet to another group.

Start putting the items into the container. If possible, allow students to volunteer to do this so that they feel more involved. After each item has been 'tested', write the word 'sink' or 'float' next to this item on the board. The groups should correct each other's predictions, awarding one point for each correct one.

Decide the winning group. If there is time, ask students to discuss which item was the most surprising. Try to elicit why this item sank or floated (e.g. was it related to the density of the material?; did the item contain hidden air pockets?; etc).

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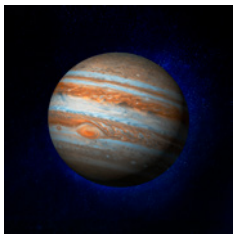
Secret words

water 	a fly 
a rock 	a planet 
a radio 	snow 
the sun 	a dinosaur 
fire 	a computer 
a tortoise 	a car 

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Worksheet

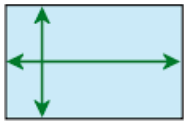
1. Warmer

- *Listen to the word that your teacher describes. What is the word?*
- *Now divide into two groups. Each group selects three students who will describe words. The rest of the group need to say the word in less than 30 seconds. Good luck!*

2a. Vocabulary

In science, it is important to measure things. Look at the table below and complete the gaps with the words from the box.

weight	**temperature**	**small**	**grams**	**short**	**metres**	**speed**

Question	We need to measure …	Units
is it long or _____?	distance 	_____ / kilometres*
is it hot or cold?	_____ 	degrees Celsius
is it big or _____?	area 	square metres (or metres squared)
is it fast or slow?	_____ 	metres per second / kilometres per hour*
is it heavy or light?	_____ 	_____ / kilograms

(* Kilometres are common units in most countries. However, in some countries they prefer to use units called *miles*. 1 mile = 1.6 kilometres)

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Worksheet

2b. Speak

With your classmate, decide if the sentences below are true or false.

a. The distance from New York to London is 1100 kilometres.

b. Water covers about 70% of the Earth.

c. Water is a combination of the elements helium and oxygen.

d. A person with a weight of 42 kilos on Earth only has a weight of 35 kilos on the moon.

e. A rabbit can run at a speed of 120 kilometres per hour.

f. The hottest temperature on Earth was 56 degrees Celsius (recorded in the USA).

g. Canada is the biggest country in the world (9.9 million square kilometres).

h. Water at 60 degrees Celsius has more volume than water at 20 degrees Celsius.

i. The fire on a candle has a temperature of over 1,000 degrees Celsius.

j. It takes eight years for light to travel from the sun to Earth.

3a. Vocabulary

In the next task, you will watch a video about science. To help you to understand the video, first match the vocabulary to the definitions.

Vocabulary	**Definition**
1. to spray	**(6)** to change from a solid to a liquid (e.g. ice changes to water)
2. a mirror	**( )** the material from a tree
3. astonishing/amazing	**( )** a type of metal which is very strong
4. wood	**( )** to push liquid from a container into the air (common for perfumes)
5. sunshine	**( )** very surprising
6. to melt	**( )** a special piece of glass that reflects – you probably have this in your bathroom
7. steel	**( )** the light from the sun

3b. Listen

Watch this video from the TV series Bang Goes The Theory *(BBC). In this clip, we see a mirror which can use energy from the sun.*

www.youtube.com/watch?v=z0_nuvPKIi8

Watch the video for the first time and answer the question below:

What three items do they put under the mirror?

Now watch the video for the second time. Choose the correct word to complete each sentence.

a. The man sprays _____ into the area under the mirror.

• water • a chemical liquid

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b. When the wood goes on fire, the presenter feels _____.

• confused • surprised

c. The temperature under the mirror is around _____.

• 350 degrees • 3,500 degrees

d. The mirror is around _____ in size.

• 2 square metres • 20 square metres

e. To arrive at the mirror, the energy from the sun travels _____ .

• 19 million miles • 93 million miles

f. The presenter is more surprised when he sees the _____ melting.

• steel • rock

3c. Speak

Discuss with your classmate:

Are you surprised by any parts of the video? Why/why not?

Describe a time in your life when something melted (snow, ice-cream, chocolate, sweets).

Do you like studying science? Why/why not?

Describe a Science Museum that you have visited.

4a. Read

In the next task, you will watch a video which shows a man running on water. Some people think that the video is real but other people think that it is fake. Read the opinions below about the video. For each opinion, decide if the person thinks that the video is real or fake.

A. I believe this video. The man doesn't sink because he is running very fast.

B. I think the video is fake. A person can float on water if they are swimming but not if they are running.

C. A stone can jump across the surface of a lake. If it's possible for a stone, it's possible for a man.

D. I think the video is a hoax. It isn't possible for a person to run fast enough to do that!

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Worksheet

4b. Vocabulary

From the opinions above, use the underlined words to complete the table below.

Definition	Words
a. a situation where people believe something which is not true	*a hoax*
b. a small rock	
c. the top part of the water	
d. false, not real	
e. to go under the water (because an item is too heavy)	
f. to stay on top of the water (because the item is not too heavy)	

4c. Listen

You will watch a video from a TV series called Outrageous Acts of Science *(Science Channel).*

www.youtube.com/watch?v=WYRNBZOKp_M

Watch the video for the first time and answer the question below:

Is the video real or fake?

Now watch the video for the second time and choose the correct word to complete each sentence.

a. Around _____ people have watched the video.

• 3.5 million • 13.5 million

b. The men say that they can run on water because they are very _____ .

• fast • light

c. To run on water, a person would need very _____ feet.

• big • small

d. The fastest man in the world (Usain Bolt) can run _____ metres per second.

• 10.4 • 13.4

e. They used a _____ to make the video.

• special computer • secret platform

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Worksheet

4d. Speak

Discuss with your classmate:

Describe a person who can run very fast (a person from your school or a famous person).

Why do some people make fake videos and put them on the internet?

Look at the items below and answer the two questions:

Could they be real?	**Do you think they are possible?**
• Aliens	• Travelling to the past or the future
• The Loch Ness Monster	• The return of dinosaurs
• Vampires	• People could live to 150 years old

5. Project: Science experiments

Experiment 1: How many paper clips?

Step 1: Take an empty plastic glass. You are going to completely fill the glass with water. Then you will put paper clips into the glass of water without spilling the water. How many paper clips can you put in the glass? Imagine where on the glass the paper clips will go to. Draw a line here with a pen or a marker.

Step 2: Fill the glass with water. Fill it completely, to the top.

Step 3: Start putting the paper clips into the glass. Do this slowly (one paper clip, then another, etc). Count the paper clips as you put them into the glass.

Step 4: When the water starts to escape from the glass, stop putting in the paper clips. Look at the line that you drew in Step 1. Were you correct?

Step 5: Which group put the most paper clips into their glass?

Step 6: Can you explain what happens when you put the paper clips into the glass of water?

Experiment 2: Sink or float?

Step 1: Work in groups. Your teacher will show you different items. On the **Sink or float (item list)**, write the names of the items. Then talk to the other pupils in your group. For each item, decide if you think it will sink or float in water.

Step 2: Give your item list to a different group.

Step 3: The teacher will put each item into a container of water.

Step 4: The winners are the group with the most correct 'sink or float' predictions.

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Worksheet

Sink or float? (item list)

Name of your group = _____

Name of item	Do you think it will sink or float?
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

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